
Space Weather Forecast

Issued on Tuesday 24 September 2024 at 13:31 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

**Space Weather Forecast Headline: Minor Geomagnetic Storm likely, mainly Day 2 (25 Sep).
Chance of Moderate flares.**

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Moderate with a Moderate-class flare peaking at 23/1457 UTC from a new region on the southeast limb with a contribution from a region in the northwest. There are currently nine sunspot regions on the visible disc, with a further new region developing in the southeast. The new region on the southeast limb remains very difficult to assess due to foreshortening near the limb, but is showing some notable looping in imagery,. Remaining regions appear mostly small or simple at the present time.

A Coronal Mass Ejection (CME) was observed 22-23 Sep, directed primarily to the south and east, mostly away from Earth. However, analysis suggests a possible glancing blow on Day 2 (25 Sep). No other Earth-directed CMEs were observed.

Solar Wind / Geomagnetic Activity: The solar wind was initially near 380 km/s with increases to around 460 km/s probably due to a weak high speed stream (HSS) connection. Interplanetary Magnetic Field was mostly moderate until around 24/0000 UTC when weak levels were resumed. The north-south component was moderately southward directed for the first few hours before rotating to become northward directed around 23/1535 UTC. Geomagnetic activity was mostly Quiet to Unsettled, becoming Active between 23/1500-1800 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected, with a chance of isolated Moderate flares.

Solar Wind / Geomagnetic Activity: The CME following a flare off the southeast quadrant on 22 Sep may give a glancing blow at Earth on Day 2 with effects potentially lasting into Day 3 (25-26 Sep). This may coincide with the arrival of a coronal hole fast wind. However, this aspect of the forecast carries low confidence. Solar winds are currently slightly elevated under the influence of what appears to be a weak HSS and are likely to remain at similar levels. If we experience a glancing blow from the above mentioned CME then wind speeds could potentially become elevated.

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Geomagnetic activity is forecast to be Quiet to Unsettled. If we see a combination of fast winds and CME influence on Days 2-3 then this will bring a likelihood of Active to G1/Minor Storm intervals. However, if we see more significant influence from the CME, then geomagnetic activity could become more significantly enhanced, with a slight chance of reaching G2-G3/Moderate-Strong Storm intervals. This is currently considered to be low confidence. Geomagnetic activity is likely to gradually ease to Quiet to Unsettled during Day 4 (27 Sep).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to be at background levels with just a very slight chance of solar radiation storms occurring.

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	10	60	30	10
Strong	G3	No	1	20	10	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	Yes	50	50	50	50
Very Active	R3-R5 (X Class)	No	5	5	5	5

Solar Radiation Storms (High Energy Protons)

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = cm ⁻² sr ⁻¹ s ⁻¹)						